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MULTIFUNCTIONAL TELEMARK BOOT

DESCRIPTION

The present invention refers to a multifunctional Telemark boot.

In general, Telemark boots of a well-known type are suitable for permitting a bending action in correspondence with an articulation of the metatarsus phalange of the foot, and comprise a containing hull for the foot, a sole which is integral with the hull, and a flexible articulation, which is part of the hull, and which is arranged substantially in correspondence with a point of the hull in order to permit the bending action of the hull itself.

Telemark boots of the type which have been described above are substantially limited in terms of their use due to the fact that the flexible articulation, which is generally defined by an upper portion of the sole which is foldable like an accordion, permits a single bending action only, without taking into account any specific environmental conditions or the specific physical conformation of the person who is using the Telemark boot.

The aim of the present invention is to produce a

Telemark boot, which will be adaptable to different conditions of use and will also permit greater adaptability to the needs of the relevant users.

According to the present invention, a Telemark boot will be produced which is suitable for permitting a bending action in correspondence with an articulation of the metatarsus phalange of the foot, the boot comprising a containing hull for the foot, and a flexible articulation which is arranged substantially in correspondence with a point of the hull in order to permit the said bending action of the hull; the boot being characterised by the fact that it comprises control means of the bending action which are associated with the hull and which are arranged in correspondence with the said flexible articulation.

The present invention will now be described, with reference to the attached drawings, which illustrate an example of a non-limiting embodiment:

- FIGURE 1 is a lateral elevation view of a preferred form of embodiment of a multifunctional Telemark boot which is produced according to the present invention;

- FIGURES 2 and 3 illustrate, with come parts in section and some parts removed for reasons of

clarity, respective alternative forms of embodiment of a detail of the Telemark boot which is shown in FIGURE 1;

- FIGURE 4 is a perspective view, with some parts removed for reasons of clarity, of a preferred form of embodiment of a detail of the Telemark boot which is shown in FIGURE 1;

- FIGURE 5 is a lateral elevation view, with some parts in section and some parts removed for reasons of clarity, of a detail which is shown in FIGURE 4;

- FIGURE 6 is a lateral elevation view, with some parts in section and some parts removed for reasons of clarity, of a detail of the Telemark boot which is shown in FIGURE 1;

- FIGURES 7, 8 and 9 illustrate a perspective view, with some parts in section and some parts removed for reasons of clarity, of respective preferred forms of embodiment of a detail which is shown in FIGURE 6;

- FIGURES 10 to 13 show a perspective view, with some parts removed for reasons of clarity, of respective preferred forms of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 14 is a lateral elevation view, with some parts in section and some parts removed for reasons of clarity, of a preferred form of embodiment of a detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 15 is a perspective view, with some parts removed for reasons of clarity, of the detail which is illustrated in FIGURE 14;

- FIGURE 16 shows a lateral elevation, with some parts in section and some parts removed for reasons of clarity, of a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURES 17 to 25 illustrate a perspective view, with some parts removed for reasons of clarity, respective preferred forms of embodiment of the detail which is illustrated in FIGURE 16;

- FIGURE 25a shows a perspective view, with some parts removed for reasons of clarity and on a reduced scale, of an alternative form of embodiment of a detail which is shown in FIGURE 25;

- FIGURE 26 shows a perspective view, with some parts removed for reasons of clarity, of a respective preferred form of embodiment of the detail which is illustrated in FIGURE 16;

- FIGURE 27 shows a lateral elevation, with some parts in section and some parts removed for reasons of clarity, of a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 28 is a perspective view, with some parts in section and some parts removed for reasons of clarity, of the detail which is illustrated in FIGURE 27;

- FIGURE 29 shows a lateral elevation view, with some parts removed for reasons of clarity, of a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 30 is a perspective view, with some parts removed for reasons of clarity, of the detail which is illustrated in FIGURE 29;

- FIGURE 31 shows a lateral elevation, with some parts in section and some parts removed for reasons of clarity, a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURES 31a-31d show, in perspective views, and with some parts removed for reasons of clarity, respective alternative preferred forms of embodiment of the detail which is illustrated in FIGURE 31;

- FIGURE 32 shows a lateral elevation, with some parts in section and some parts removed for reasons of clarity, an alternative respective form of embodiment of the detail which is illustrated in FIGURE 31;

- FIGURE 33 is a plan view, with some parts in section and some parts removed for reasons of clarity, of a further preferred form of embodiment of the detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 34 is a perspective view, with some parts in section and some parts removed for reasons of clarity, of the detail which is illustrated in FIGURE 33;

- FIGURES 35 and 36 show a lateral elevation, with some parts in section and some parts removed for reasons of clarity, respective alternative preferred forms of embodiment of the detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 37 shows a perspective view, with some parts in section and some parts removed for reasons of clarity, a further preferred form of embodiment of the detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 38 shows a lateral elevation, with

some parts in section and some parts removed for reasons of clarity, the detail which is illustrated in FIGURE 37;

- FIGURES 39 and 40 show a perspective view, with some parts in section and some parts removed for reasons of clarity, respective preferred forms of embodiment of a detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 41 shows a lateral elevation, with some parts in section and some parts removed for reasons of clarity, a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURES 42a and 42b show, respectively, a perspective view and a lateral elevation, with some parts in section and some parts removed for reasons of clarity, a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURES 43a and 43b show, respectively, a perspective view and a lateral elevation, with some parts in section and some parts removed for reasons of clarity, a preferred form of embodiment of a further detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 44 shows a perspective view, with some parts removed for reasons of clarity, a further preferred form of embodiment of a detail of the Telemark boot which is illustrated in FIGURE 1;

- FIGURE 45 shows a perspective view, with some parts removed for reasons of clarity, an alternative form of embodiment of the detail which is illustrated in FIGURE 44;

- FIGURES 46 and 47 show, respectively, a lateral elevation and a perspective view of a further preferred form of embodiment of the Telemark boot which is illustrated in FIGURE 1; and

- FIGURES 48a, 48b, 48c, and 48d show a perspective view, with some parts removed for reasons of clarity, respective alternative preferred forms of embodiment of the Telemark boot which is illustrated in FIGURE 1.

With reference to FIGURE 1, the number 1 refers to a multifunctional Telemark boot in its entirety.

The boot 1 is suitable for permitting a bending action in correspondence with an articulation of the metatarsus phalange of the foot, and comprises a containing hull 2, which is suitable for containing a foot inside its own interior, and is delimited by two lateral walls 3 which are arranged opposite a

longitudinal axis A, a connecting point 4 between the two lateral walls 3 transverse to the axis A, and an upper arched wall 5 which is connected to the walls 3 and the point 4.

The boot 1 also comprises a sole 6 which is integral with the walls 3 and the point 4, and a flexible articulation 7, which is arranged substantially in correspondence with the point 4 in order to permit the bending action of the hull 2, and which presents a window 8 which extends through the wall 5.

Finally, the boot 1 comprises a control device 10 for controlling the bending action, which is arranged in such a way as to substantially close the window 8, and is associated with the hull 2 in order to permit the control of the bending action of the hull 2 itself in correspondence with the articulation 7, which in the following drawings will be illustrated in schematic form with the aim of simplifying the drawings themselves.

According to the illustrations which are shown in FIGURES 2 and 3, the device 10 comprises at least two collapsible chambers 11, which are arranged one after each other and transverse to the axis A, and are defined by respective walls 12 which are made of

flexible material and are elastically correlated in relation to each other, or rather are arranged connected along respective flexible hinges 13 which are arranged transverse to the axis A.

The walls 12 are also slotted into the wall 5 at their opposite ends in correspondence with the articulation 7 and are suitable for bending during the bending action of the articulation 7 itself.

In the form of embodiment which is shown in FIGURE 2, the chambers 11 present a substantially quadrangular shape and there are four of them, while in the form of embodiment which is shown in FIGURE 3, the chambers 11 present an elliptical shape, and there are three of them. In both cases, the walls 12 define with the hull 2 further chambers 11a, which present a shape which is complementary to a shape of the chamber 11, and which are arranged so as to alternate in relation to the chambers 11, and which have the same function as the chambers 11.

With the aim of modifying the control capacity of the device 10 in different ways which are suitable for different conditions of use of the boot 1, the chambers 11, as well as the chambers 11a, can be empty or they can be filled with compressed air, or with material which presents different

values of density, such as, for example, gelatinous or viscous material.

According to the illustrations which are shown in FIGURES 4 and 5, the device 10 comprises two chambers 11' which are arranged partially overlapping along the axis A. In this case, the walls 12, alternatively to those shown in FIGURES 2 and 3, present a substantially curved shape and both present a respective end which is connected to the point 4. In particular, the chamber 11' which is arranged nearest to the point 4 is delimited at its lower and upper ends by both the walls 12 and the relative wall 12 presents an end which is connected to the other wall 12, while the chamber 11' which is arranged furthest from the point 4 is delimited at its upper end by the relative wall 12 and the wall 5.

Also in this case, the chambers 11' can be empty or filled as has been previously described.

In the alternative form of embodiment which is shown in FIGURE 6, the two walls 12 are in the shape of an arch of a cylinder with a generating line which is transverse to the axis A and with their own opposite ends engaged on the wall 5, and they are arranged co-axially in relation to each other as the

chambers 11' are also arranged co-axially in relation to each other, and are arranged totally overlapping along the axis A.

The device 10 also comprises a stiffening device 20, which is arranged along the axis A in order to confer greater longitudinal stiffness upon the device 10 itself, and is illustrated according to alternative forms of embodiment in FIGURES 7 to 13.

In particular, FIGURE 7 shows a device 20 which comprises a number of flaps 21, which are arranged parallel in relation to each other and transverse to the axis A, and are preferably, but not necessarily, distributed inside the chambers 11". Such flaps 21 connect the walls 12, and divide the chambers 11" into compartments 22, which are orientated transverse to the axis A, and which can be filled with gelatinous material or not filled at all.

FIGURE 8 shows a device 20 which comprises a number of flaps 21', which are arranged parallel to the axis A and are distributed around the device 10 externally to the hull 2. The flaps 21' present a section which is transverse to the axis A and which is of variable dimensions, and they are tapered in correspondence with their own opposite ends 23,

which are engaged on the upper wall 5 of the hull 2.

FIGURE 9 shows a device 20 which comprises a number of shaped ribs 21", which are arranged along the axis A and are distributed externally to the hull 2 in such a way as to match or not with any one of the chambers and relative walls which have been described above, or rather, in such a way as to match with a respective wall 24 which is arranged in such a way as to close the window 8. The ribs 21" radiate starting from the point 4 above the articulation 7, and they present a zig-zag shape which gets shorter towards the lateral walls 3 of the hull 2.

FIGURE 10 shows a device 20 which comprises an external moulding 25, which is arranged parallel to the axis A in a central position in relation to the window 8, and which can match or not with any one of the chambers and the relative walls which have been described above in order to increase the resistance to bending action of the hull 2.

FIGURE 11 shows a device 20 which comprises an S-shaped external moulding 26, which is arranged along the axis A in a central position in relation to the window 8, and which can be matched or not with any one of the chambers and the relative walls

which have been described above in order to increase the resistance to bending action of the hull 2.

FIGURE 12 shows a device 20 which comprises a moulding 27, which is arranged at an inclination in relation to the axis A and which extends starting from a lateral wall 3 to a little beyond the centre of the window 8.

FIGURE 13 shows a device 20 which comprises two mouldings 27', which are arranged at an inclination in relation to the axis A and which each extend starting from a relative lateral wall 3 to a little beyond the centre of the window 8 in order to cross each other in correspondence with a media zone of the window 8 itself.

In order to match or not with the above-described elements of the device 20 comprises, as is better illustrated in FIGURES 14 and 15, a support arch 30, which is arranged transverse to the axis A, and which extends from a lateral wall 3 to the other one and along the whole of the window 8.

The arch 30 presents two brackets 31 of a substantially triangular shape which are anchored in correspondence with their own bases 32 to the sole 6, and are connected to each other in correspondence

with their own apexes 33 by a bar 34 which extends astride from the median zone of the window 8.

With the aim of varying the elastic and rigid characteristics of the arch 30, the brackets 31 can present one or more shaped passing holes, and the bar 34 can present thickness and shapes of different dimensions.

Furthermore, the device 10 comprises a determined number of tongues 40, which are integral with the hull 2, and which extend from the walls 7 or from the point 4 towards the inside of the window 8 conforming the window 8 itself and defining a determined number of preferential bending lines 41 of the flexible articulation 7.

The number of lines 41 varies from case to case according to the conformation presented by the tongues 40 determining also, as a consequence, both a variation in the conformation of the window 8, as well as a variation in the capacity to control bending action of the device 10.

FIGURES 16 to 24 illustrate, in the interest of providing examples, but not exhaustively, different conformations of the tongues 40 and the window 8 which will be briefly described below purely as an indication.

The device 10 which is illustrated in FIGURE 16 comprises two pairs of tongues 40, which extend opposite the hull 2 towards each transverse to the axis A, and they define two bending lines 41 which are transverse to the axis A. Furthermore, the tongues 40 of each pair of tongues define in relation to each other and with the hull 2 three respective loops 42, which elongate inside the walls three, and which present a variable depth which increases towards the point 4.

The bending lines 41 can also extend on the walls 12 which have previously been described consequently conforming the chambers 11 and determining consequent variations in the elastic and rigid capacity of the device 10.

The device 10 which is shown in FIGURE 17 comprises, for each lateral wall 3, two tongues 40, which are inclined and which taper progressively towards the median zone of the window 8, and which define in relation to each other and with the hull 2 three respective loops 42.

The loops 42 elongate inside the walls 3, and present a variable depth which decreases towards the point 4. Furthermore, the loops 42 which are arranged in correspondence with the point 4 join

each other in order to define a common loop 43, which tapers along the axis A going towards the point 4 itself.

The device 10 which is shown in FIGURE 18 is substantially identical to that which is shown in FIGURE 17 and comprises, for each lateral wall 3, two tongues 40 which are inclined and which taper progressively towards the median zone of the window 8, and which define in relation to each other and with the hull 2 three respective loops 42. Both the tongues 40 and the loops 42 present their own respectively substantially pointed ends.

The device 10 which is illustrated in FIGURE 19 comprises, for each lateral wall 3, a tongue 40 which is inclined and which tapers progressively towards the median zone of the window 8, and which defines with the hull 2 a loop 42 which extends substantially as far as the sole 6, and which defines with the other tongue 40 a frontal loop 53 which is of a substantially ovoid shape.

The device 10 which is shown in FIGURE 20 comprises, for each lateral wall 3, a tongue 40, which presents a substantially triangular shape with a broad base 44 which is orientated towards the sole 6, and which subdivides the window 8 into two loops

42, which extend and taper from the median zone of the window 8 itself towards the sole 6, and into a central loop 45, which extends long the whole of the median zone and tapers towards the point 4.

The device 10 which is shown in FIGURES 21 and 22 comprises, for each lateral wall 3, a tongue 40 which is connected at the base, or rather in correspondence with the point 4, to the tongue 40 of the other lateral wall 3, and which extends from the point 4 itself on the respective wall 3 tapering progressively along the axis A.

The device 10 also comprises a flexible intermediate bridge 46, which is arranged between the two tongues 40, and which extends along the axis A stride the window 8 and connects the point 4 to the hull 2.

The device 10 which is shown in FIGURES 23 and 24 is obtained by specularly doubling the tongues 40 which are shown in FIGURE 19 in relation to a line 41. In particular, the device 10 which is shown in FIGURES 23 and 24 comprises, for each lateral wall 3,, a tongue 40′ which is of a triangular shape and which is arranged between two adjacent loops 42, and which presents a frontal loop 43 which is of a substantially ovoid shape and which is arranged in

correspondence with the point 4, and a similar loop 43' which is of a substantially ovoid shape and is specular to the loop 43 in relation to the tongue 40', or rather extends along the axis A inside the wall 5.

The device 10 which is shown in FIGURES 25 and 26 is substantially obtained by adding the loop 43' to the device which is shown in FIGURE 20, and by shaping an end of the loop 45 by means of a double protuberance 43 which enters inside the loop 45 itself.

Instead, the device 10 which is shown in FIGURE 25a is substantially obtained by adding a shaped strip 48 to the device 10 which is shown in FIGURE 25, and which extends along the whole of a perimeter of the tongue 40, and incorporates the double protuberance 47. The strip 48 presents a thickness which is greater than a thickness of the hull 2, and due to this greater thickness it permits a further control on the part of the device 10 in terms of the bending action of the hull 2 itself.

According to the illustrations which are shown in FIGURES 27 and 28, the device 10 comprises a valve 50, which is arranged in the centre of the window 8, and which can be combined with any form of

embodiment of the device 10 whatsoever which has previously been described. The valve 50 can be activated by the device 10 itself, and is suitable for regulating a flow of air into and out of the hull 2.

In particular, the valve 50 comprises an angular cushion 52 which is anchored along the border to the window 8, and a central cushion 52, which is arranged inside the cushion 51, and which presents a central hole 53 which communicates with the inside of the hull 2. The two cushions 51 and 52, other than contributing to a further control of the bending action of the articulation 7, may also be combined with the walls 12 in the interests of providing an example.

According to the illustrations which are shown in FIGURES 29 and 30, the device 10 comprises a flexion rod 60, which is coupled to the flexible articulation 7 in combination with any one of the above-described examples whatsoever, and which extends longitudinally along the axis A towards a collar 61 of the hull 2. The rod 60 permits a supplementary regulation of the bending action of the boot in a zone which is outside the flexible articulation 7, and it is engaged at its own

opposite ends in correspondence with the flexible articulation 7 itself and on the collar 61.

With the aim of varying its own flexible and rigid characteristics, the rod 60 is provided with a number of shaped passing holes 62, which are arranged one after the other along the rod 60 itself.

According to the illustration which is shown in FIGURE 31, the device 10 comprises either in addition to or instead of, for example, the chambers 11, a flexible frame 70 which is arranged so as to cover the window 8 in correspondence with the flexible articulation 7. The frame 70 is defined by a plate 71 which is provided, as shown in FIGURES 31a and 31b, with a number of shaped holes 72, or rather it is defined, as shown in FIGURE 31c, by one or two sinuous ribs 73 which extend along the axis A.

As a further alternative, the frame 70 is defined, as shown in FIGURE 31d, by a number of semi-cylindrical bodies 74, which are arranged transverse to and along the axis A, and which are connected laterally in relation to each other along respective joints 75. Or, as another further alternative, the frame 70 is defined, as shown in

FIGURE 31e, by a box-shaped body 76 which is provided with an outer wall 77 which progresses either according to a sawtooth shape or according to a corrugated shape like that which is presented by the bodies 74.

According to the schematic illustration which is shown in FIGURE 32, the flexible frame 70 can also extend as far as the collar 61 with the aim of supplying, as in the case of the rod 60, a supplementary regulation of the bending action of the boot 1 in a zone which is outside the articulation 7.

According to the illustrations which are shown in FIGURES 33 and 34, the device 10 comprises, either as an addition to or as a replacement for, for example, the chambers 11, a pair of vibrating elements 80, which are arranged in such a way as to close the window 8 and on the walls 3, and which are provided with respective forks 81 which face one another with their tips.

In particular, the vibrating elements 80 are in the shape of a tuning fork, and are embedded inside a covering layer 82 of the window 8, and present the relative forks 81 arranged transverse to the axis A in order to exert an elastic force along the axis A

itself, and the relative legs 83 which are arranged along the walls 3 and which are substantially embedded in the sole 6.

According to the illustration which is shown in FIGURE 35, the device 10 comprises, in addition to or as a replacement for, for example, the chambers 11, a concave wall 90, which is arranged in such a way as to close the window 8, and which is open towards the outside in order to define a shaped housing 91 which is arranged transverse to the axis A.

The wall 90 is substantially C-shaped in a section along the axis A, and it presents a thickness the value of which may be varied when the boot 1 is undergoing the construction phase in order to vary the elastic and rigid characteristics of the articulation 7.

The device 10 also comprises, as is better illustrated in FIGURE 31, a cushion 92 which is made of gelatinous material, or which is filled or not with compressed air, or with materials of different density, as has previously been described. The cushion 92 is arranged inside the housing 91, and can also completely replace the wall 90 in the case in which the housing 91 is created as a piece with

the wall 5.

According to the illustrations which are shown in FIGURES 37 and 38, the device 10 comprises, either in addition to or as a replacement for, for example, the chambers 11, two flat appendixes 100, which are integral with the hull 2, and which extend on the median zone of the window 8, overhanging the wall 5, and opposite the point 4 with diminishing thickness and width.

The two appendixes 100 are suitable for gradually entering into contact with each other and with the hull 2 in order to increase the bending action of the hull 2 itself in correspondence with the articulation 7.

According to the illustrations which are shown in FIGURES 39 and 40, the device 10 also comprises an elastic element 110, which is arranged inside the hull 2 and which is suitable for exerting a distending elastic action on the articulation 7.

In particular, the elastic element 110, as shown in FIGURE 39, is embedded in the sole 6, and comprises two comb plates 111 which are hinged to each other in correspondence with a hinge 112 which is transverse to the axis A, in order to form, in correspondence with the hinge 112 itself, a torsion

spring 113 which is arranged transverse to the axis A. The two plates 111 are arranged opposite the articulation 7 in such a way as to arrange the hinge 112 with its own axis B in correspondence with the articulation 7 itself, and in such a way as to exert a distending elastic action of the sole 6 with each furrow taken by the boot 1.

Instead, as shown in FIGURE 40, the elastic element 110 comprises two torsion springs 113 which are arranged in correspondence with each wall 3 along the axis B, and two connecting bridges 114, which connect between them the two springs 113, and which run below the walls 3 and the wall 5, or, according to a form of embodiment which is not illustrated, but which is easily understandable from the current description, are arranged parallel to the sole 6 as are the plates 111.

The springs 113 tend to exert a distending elastic action of the sole 6 or rather an elastic action which is concordant with the elastic action of the plates 111.

According to the illustration which is shown in FIGURE 41, the device 10 also comprises an elastic plantar 120, which is arranged in a position overhanging the sole 6, and is shaped in such a way

as to present a reduction in thickness in correspondence with the flexible articulation 7. In particular, the plantar 120 presents a substantially constant thickness for the whole of its length, and comprises a flexible portion 121 and a compensating portion 122 which is arranged in an intermediate position between the portion 121 and the point 4. The portion 121 presents a substantially semi-cylindrical cavity 123, which is open towards the sole 6, and which presents its own apex of maximum depth substantially in correspondence with the articulation 7, and which is connected with the portion 122, which defines, instead, a cushion which extends inside the sole 6.

According to the illustrations which are shown in FIGURES 42a and 42b, the device 10 also comprises an insert 130 which is inserted in the sole 6 in such a way that it can be uncoupled, and which presents a number of projecting stiffening outlines 131, which are arranged transverse to the axis A both to render the insert 130 integral with the sole 6, and to modify the elastic characteristics of the sole 6 itself by co-operating with the elements which have already been described concerning the function of the device 10.

In the form of embodiment which is illustrated, the insert 130 presents three projecting outlines 131a of a substantially cylindrical shape which are laterally arranged one beside the other, and a projecting box-shaped outline 131b which is arranged between the projecting outlines 131a and the point 4.

The insert 130 also comprises two end outlines 132 and 133, of which the outline 132 is inserted inside a respective housing 132a which is obtained in the sole 6 in correspondence with a plantar arch 134a of the boot 1, while the outline 133 is inserted in correspondence with a respective shaped housing 135 which is obtained in correspondence with a point 136 of the sole 6. The two outlines 132 and 133 are maintained blocked inside the respective housings 134 and 135 by a screw 137, and by a poppet 138 which is operated by means of a passing hole 139 of the point 136.

According to the illustrations which are shown in FIGURES 43a and 43b, the device 10 also comprises a stiffening fork 140, which is mounted laterally to the sole 6 inside two grooves 141 parallel to the axis A, and which is fixed in correspondence to the plantar arch 134a by a screw 142. In particular, the

fork 140 presents two arms 143 which are provided with respective shaped projecting outlines 144 which can be inserted inside the grooves 141, and a connecting head 145 between the two arms 143 which is defined by two prisms 146, which are integral with the relative arms 143, and which can be coupled to each other in correspondence with respective sawtooth outlines 147 in order to be thus blocked by the screw 142. The outlines 147 enable the distance between the arms 143 to be gauged according to the width of the sole 6.

According to the illustration which is shown in FIGURE 44, the device 10 comprises, in addition to or as a replacement for some of the above-described structural elements, a bellows 150 which is arranged in correspondence with the articulation 7, and four shaped plates 151 which are arranged two by two laterally to the bellows 150 itself. The two plates 151 of each side present a substantially identical shape in relation to each other and are specularly arranged in relation to a median line 153 which passes through the articulation 7 and is transverse to the axis A.

In particular, each plate 151 comprises a respective tongue 154 which extends towards the

median line of the hull and along a respective border 155 of the bellows 150, and which forms with the tongue 154 of the other plate 151 a loop 156 which is arranged with its own concavity turned towards the bellows 150. Furthermore, each plate 151 presents, substantially in correspondence with the sole 6, an outlet 157, which forms with the outlet 157 of the other plate 151 an eyelet 158 which communicates with the loop 157 by means of a channel 159 which is defined by the two plates 151, and which is filled together with the eyelet 158, with plastic material.

Each plate 151, being applied in such a way as to abut the bellows 150 which is in turn made of plastic material or fabric, contributes to modifying the control characteristics of the device 10 in terms of the bending action of the boot 1.

According to the illustration which is shown in FIGURE 45, each of the two plates 151 may also be provided with a respective notch 160, which is wedged inside the channel 159, replacing the filling material of the channel 159 itself and further modifying the above-mentioned control characteristics of the device 10.

According to the illustrations which are shown

in FIGURES 46 and 47, the plates 151 can be replaced by three bulges 170, 171a, and 171b, of which the bulge 170 presents a triangular plane and extends along the median line of the hull 2 as far as the bellows 150, while the bulges 171a and 171b are arranged in correspondence with the point 4 opposite the bellows 150 in relation to the bulge 170.

The bulges 170, 171a and 171b present a variable rigidity as a result of their own thickness and their own width, and are preferably, but not necessarily, made of plastic material.

The two bulges 171a and 171b, which are arranged on the ideal continuation of the outer sides of the bulge 170, are separated from each other by an intermediate flattening 172, which contributes to modifying the rigid characteristics of the point 4.

Finally, according to the illustrations which are shown in FIGURES 48a, 48b, 48c and 48d, the device 10 comprises, in addition to or as a replacement for some of the above-described structural elements, a furrow 180 which is obtained through the point 4, and which is filled with a pad 181 made of piezo-electric material, which is suitable for heating itself due to the deformation

which is caused by the impacts of the bending action, and which presents a determined shape which is suitable for controlling the same bending action impacts.

In FIGURE 48a, the furrow 180 comprises a substantially circular central portion 182 and two lateral portions 183, which present an arrow shape and which extend, getting thinner as they go, starting from the portion 182.

In FIGURE 48b, the furrow 180 presents an ovoid shape, and is elongatedly arranged along the median line of the hull 2.

In FIGURE 48c, the furrow 180 is obtained laterally to the point 4 and in this form of embodiment it also presents an elongated ovoid shape parallel to the sole 6.

Finally, in FIGURE 48d, the furrow 180 presents a substantially triangular shape, and it tapers towards the point 4 starting from the bellows 150. In this case the furrow 180 may be only partially filled with two pads made of piezo-electric material 181.

It is clear from the above description that the boot 1 provided with the device 10 in its different forms of embodiment which are usable separately from

each other or in combination with each other lends itself to being used for different kinds of footwear and, furthermore, also and not only for the practice of Telemark.

It is intended that the present invention should not be limited to the forms of embodiment which are herein described and illustrated, which are to be considered of examples of forms of embodiment of a multifunctional Telemark boot, which may instead be subject to further modifications relating to the shape and disposition of its parts, as well as to details pertaining to construction and assembly.